

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

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**PROPOSED STATE STANDARD,  
TITLE 8, CHAPTER 4**

Amend Section 5154.1 to read:

§5154.1. Ventilation Requirements for Laboratory-Type Hood Operations.

\* \* \* \* \*

(b) Definitions.

\* \* \* \* \*

**Hazardous Substance.** One which by reason of being explosive, flammable, poisonous, an irritant, or otherwise harmful, is likely to cause injury or illness in the form and manner used.

**Laboratory-Type Hood.** A device enclosed except for necessary exhaust purposes on three sides and top and bottom, designed to draw air inward by means of mechanical ventilation, operated with insertion of only the hands and arms of the user, and in which used to contain hazardous substances are used. These devices are also known as laboratory fume hoods.

(c) Ventilation Rates.

(1) Laboratory-type hood face velocities shall be sufficient to maintain an inward flow of air at all openings into the hood under operating conditions. The hood shall provide confinement of the possible hazards and protection of the employees for the work which is performed. The exhaust system shall provide an average face velocity of at least 100 linear feet per minute with a minimum of 70 fpm at any point, except where more stringent special requirements are prescribed in other sections of the General Industry Safety Orders, such as Section 5209. The minimum velocity requirement excludes those measurements made within 1 inch of the perimeter of the work opening.

(2) When a laboratory-type hood is in use to contain airborne hazardous substances and no employee is present at the hood such that it could be accessed, the ventilation rate may be reduced from the minimum average face velocity of at least 100 feet per minute to a minimum average face velocity of 60 feet per minute if the following conditions are met:

(A) The reduction in face velocity is controlled by an automatic system which does not require manual intervention. The automatic system shall increase the airflow to the flow required by (c)(1) when the hood is accessed.

(B) The laboratory-type hood has been tested at the reduced flow rate according to the tracer gas method specified in Section 7, Tracer Gas Test Procedure, of ANSI/ASHRAE 110-1995, Method of Testing Performance of Laboratory Fume Hoods, which is hereby incorporated by reference, and has a hood performance rating of 4.0 AU 0.1 or less. The test may be performed with or without the mannequin described in the ANSI/ASHRAE 110-1995 tracer gas method.

(C) Records of the tracer gas test results and the "as used" test configuration must be maintained as long as the automatic system is operable and thereafter for five years.

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(e) Special Requirements.

(1) The face velocity required by subsection (c) should be obtainable with the movable sashes fully opened. Where the required velocity can only be obtained by partly closing the sash, the sash or jamb shall be marked to show the maximum opening at which the hood face velocity will meet the requirements of subsection (c). Any hood failing to meet the requirements of subsection (c) and this paragraph shall be considered deficient in airflow and shall be posted with placards, plainly visible, which prohibit use of hazardous substances within the hood.

(2) When flammable gases or liquids are used, or when combustible liquids are heated above their flashpoints, hoods ~~that are not bypassed shall have permanent stops installed which will restrict closure of the sash so that sufficient airflow is maintained to prevent explosions~~ shall be designed, constructed, and installed so that hood openings at all sash positions provide sufficient airflow to prevent ignitable concentrations. Concentrations in the duct shall not exceed 20% of the lower explosive limits.

(3) In addition to requirements in Section 5143(a)(5), a ~~means~~ quantitative device shall be provided ~~at the hood to continuously indicate that air is flowing into the exhaust system during operation that continuously measures the average face velocity of the hood.~~ This quantitative device shall be capable of indicating that the hood ventilation rate provides the average minimum face velocity specified in subsection (c) within an accuracy of + or - 20%. The ability of the hood to maintain an inward airflow as required by (c) above shall be demonstrated ~~using smoke tubes or other suitable qualitative methods upon initial installation; by the method specified in Section 6, Flow Visualization and Velocity Procedure, of ANSI/ASHRAE 110-1995, Method of Testing Performance of Laboratory Fume Hoods, which is hereby incorporated by reference.~~ This demonstration shall be performed upon initial installation and on an annual basis thereafter, after repairs or renovations of the facility, hood or ventilation system; or the addition of large equipment into the hood.  
EXCEPTION: The frequency of the tests may be reduced to every two years if a calibration and maintenance program is in place for the quantitative airflow measuring device.

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(7) When perchloric acid is evaporated in laboratory-type hoods, the provisions of Section 5143(a)(4) shall apply. The materials of construction shall be ~~nonorganic (except for unplasticized polyvinyl chloride)~~ inert, smooth, and nonabsorbent. Organic polymers shall not be used except for inert fluoropolymers, such as polytetrafluoroethylene [PTFE] and tetrafluoroethylene-hexafluoropropylene copolymer [Teflon FEP], or similar nonreactive material. The hood and exhaust system shall be washed down with water for decontamination and prior to opening for maintenance.

EXCEPTION: Portable laboratory scrubbing apparatus for perchloric acid digestions may be used in lieu of the special requirements of this paragraph.

(f) Operator Qualifications. The employer shall ensure that employees who use laboratory-type hoods are able to:

(1) Use the hood and its features safely;

(2) Determine the date of the last performance test and if the hood performance met the requirements of this section;

(3) Understand the general hood purpose, airflow characteristics, and potential for turbulent airflow and escape of hazardous substances from the hood; and,

(4) Read the airflow meter to determine that the minimum face velocity is provided.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.